

Notice of Allowability

Application No.

10/607,943

Applicant(s)

PHAN ET AL.

Examiner

Art Unit

Tuan V. Ho

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to ____.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date ____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____

Tuan V Ho
Primary Examiner
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1. Claims 1-20 are allowed.

The prior art of record fails to suggest or disclose:

With regard to claim 1, a circuit for reducing oversaturation effects within CMOS image sensors, comprising a detector that is configured to determine whether an oversaturation condition exists at a detection time that is after the initialization period and that is before the end of the integration period by monitoring a decrease in the first output signal that is associated with the remaining stored charge of the first pixel; and a first sampler that is configured to sample after the exposure period the first output signal to produce a first pixel sampled quantity that is associated with a first pixel within an image, sample in response to the detector determining that an oversaturation condition exists a second reference voltage after the detection time to produce a first reference sampled quantity, sample in response to the detector determining that an oversaturation condition does not exist the first output signal to produce the first reference sampled quantity, and to subtract the first pixel sampled quantity from the reference sampled quantity to produce a first pixel value for the image.

With regard to claim 8, a method for reducing oversaturation effects within CMOS image sensors, comprising

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determining whether an oversaturation condition exists at a detection time that is after the initialization period and that is before the end of the integration period by monitoring a decrease in the first output signal that is associated with the remaining stored charge of the first pixel; sampling after the exposure period the first output signal to produce a first pixel sampled quantity that is associated with a first pixel within an image; sampling in response to the determination that an oversaturation condition exists a second reference voltage after the detection time to produce a first reference sampled quantity; sampling in response to the detector determining that an oversaturation condition does not exist the first output signal to produce the first reference sampled quantity; and subtracting the first pixel sampled quantity from the reference sampled quantity to produce a first pixel value for the image.

With regard to claim 15, a circuit for reducing oversaturation effects within CMOS image sensors, comprising means for determining whether an oversaturation condition exists at a detection time that is after the initialization period and that is before the end of the integration period by monitoring a decrease in the first output signal that is associated with the remaining stored charge of the first pixel; means for sampling

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after the exposure period the first output signal to produce a first pixel sampled quantity that is associated with a first pixel within an image; means for sampling in response to the determination that an oversaturation condition exists a second reference voltage after the detection time to produce a first reference sampled quantity; means for sampling in response to the detector determining that an oversaturation condition does not exist the first output signal to produce the first reference sampled quantity; and means for subtracting the first pixel sampled quantity from the reference sampled quantity to produce a first pixel value for the image.

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Altice JR. et al (US 2006/0065814 A1) discloses a CMOS image sensor that includes an anti-blooming transistor.

Brehmer et al (US 2003/0133627 A1) discloses a COMS image sensor with oversaturation circuit.

Barna (US 2004/0036783 A1) discloses a CMOS pixel array that includes oversaturation protection circuit.

Ovsiannikov et al (US 2005/0030401 A1) discloses a CMOS sensor that includes a method for changing a dynamic range of the array.

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3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TUAN HO whose telephone number is (571) 272-7365. The examiner can normally be reached on Mon-Fri from 7AM to 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is (572) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Customer Service whose telephone number is (571) 272-2600.



TUAN HO

Primary Examiner

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